

CLAIMS

1. A method of depositing a metallic layer on an exposed surface of previously deposited insulating layer on a substrate including treating the exposed surface with hydrogen or a gaseous source of hydrogen in the presence of a plasma, prior to or during deposition of the metallic layer.
2. A method as claimed in Claim 1 wherein the hydrogen treatment modifies the exposed surface.
3. A method as claimed in Claim 1 wherein hydrogen is implanted in the exposed surface.
4. A method as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein the extent of the hydrogen treatment is such that the x-ray diffraction peak half width on a crystallographic plane of a deposited metallic layer is narrowed.
5. A method as claimed in Claim 4 where the metallic layer is aluminium nitride.
6. A method as claimed in ^{Claim 1} ~~any one of the preceding claims~~ wherein the plasma is an Inductively Coupled Plasma.

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7. A method as claimed in Claim 6 wherein the substrate is placed on an RF biased platen.

8. A method as claimed in Claim 7 wherein the platen is heated.

5 9. A method as claimed in ^{Claim 1} ~~any one of Claims 1 to 4~~ wherein the plasma means is Reactive Ion Etching.

10. A method as claimed in Claim 9 wherein the treatment time is less than 15 minutes.

10 11. A method of depositing a metallic layer including the modification of its crystallographic structure by the use of atomic hydrogen.

12. A method as claimed in Claim 11 wherein the metallic layer is deposited by sputtering and molecular hydrogen is added to a metallic sputtering process.

15 13. A method as claimed in Claim 11 ~~or Claim 12~~ wherein the metallic layer is titanium or a titanium alloy and the modification includes the enhancement of the <002> crystallographic orientation of the titanium or alloy.

14. A method as claimed in Claim 11 ~~or Claim 12~~ wherein the

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metallic layer is copper, copper alloy, aluminium, or an aluminium alloy or titanium nitride the modification includes the enhancement of the $\langle 111 \rangle$ crystallographic orientation of the metallic layer.

- 5 15. A method of forming an acoustic wave device including depositing a metallic layer in accordance with a method as claimed in ^{Claim 1} ~~any one of the preceding claims.~~

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